WHAT IS CLAIMED IS:

1. An engine rotation stop control apparatus for stopping at least one of ignition control and fuel injection control, the control apparatus comprising:

engine stop command generating means for generating an engine stop command; and

stop-time compression pressure increase control means for increasing a compression pressure in a compression stroke of an engine in response to the engine stop command.

2. The engine rotation stop control apparatus according to claim 1, wherein the stop-time compression pressure increase control means increases an intake air quantity in a suction stroke of the engine just before engine rotation stop to increase the compression pressure in a subsequent compression stroke.

3. The engine rotation stop control apparatus according to claim 1, further comprising:

storage means for storing information of an engine rotation stop position when the engine rotation is stopped by the stop-time compression pressure increase control means; and

engine control means for starting at least one of ignition control and fuel injection control at the time of engine starting by means of information of the engine rotation stop position stored in the storage means as information of an initial position of an engine crankshaft.

4. The engine rotation stop control apparatus according to claim 1, wherein the stop-time compression pressure increase control means increases an opening degree of a throttle valve provided in an intake passage or an idling speed control valve of the engine to increase an intake air quantity.

5. The engine rotation stop control apparatus according to claim 1, wherein the stop-time compression pressure increase control means modifies an opening and closing timing or lift of an intake valve provided in the engine to increase an intake air quantity.

6. An engine rotation stop position control apparatus comprising:

engine stop means for stopping at least one of ignition and fuel injection on the basis of an engine stop command to stop engine rotation;

first parameter calculation means for calculating a parameter representative of engine operations,

second parameter calculation means for calculating a parameter which obstructs engine operations; and

rotation stop position estimation means for estimating an engine rotation stop position in the course, in which the engine stop means stops engine rotation, on the basis of the parameter representative of engine operations and the parameter for obstructing the engine operations, which are calculated by the first parameter calculation means and the second parameter

calculation means.

7. The engine rotation stop position control apparatus according to claim 6, wherein the engine stop command is generated by either of an ignition switch OFF signal and an idling stop ON signal.

8. The engine rotation stop position control apparatus according to claim 6, wherein the first parameter calculation means calculates at least one of kinetic energy of an engine, rotational speed, crankshaft angular velocity, and piston traveling speed, as the parameter representative of motions.

9. The engine rotation stop position control apparatus according to claim 6, wherein the first parameter calculation means calculates the parameter representative of motions every crank angle part obtained by dividing 720 °CA by the number of cylinders of the engine.

10. The engine rotation stop position control apparatus according to claim 6, wherein the first parameter calculation means calculates an instantaneous value at a timing of calculation.

11. The engine rotation stop position control apparatus according to claim 6, wherein the second parameter calculation means calculates at least one of pumping loss, friction loss

in respective parts, and driving loss in respective auxiliary devices, as the parameter for obstructing motions.

12. The engine rotation stop position control apparatus according to claim 11, wherein the second parameter calculation means calculates the parameter for obstructing motions, taking into account at least one of mass of and a diameter of rotational motions of portions related to engine operations and moment of inertia of an engine.

13. The engine rotation stop position control apparatus according to claim 6, wherein the second parameter calculation means calculates the parameter for obstructing motions, at least once in the course, in which the engine stops rotation.

14. The engine rotation stop position control apparatus according to claim 6, wherein the second parameter calculation means calculates a quantity, by which engine operations are obstructed, on the basis of that parameter representative of motions, which is calculated this time by the first parameter calculation means, and the parameter representative of motions, which is calculated at the last time.

15. The engine rotation stop position control apparatus according to claim 6, wherein the second parameter calculation means calculates a quantity, by which engine operations are obstructed, in a crank angle obtained by dividing 720 °CA by

the number of cylinders of the engine.

16. The engine rotation stop position control apparatus according to claim 6, wherein the rotation stop position estimation means estimates a parameter representative of future motions on the basis of that parameter representative of motions, which is calculated this time by the first parameter calculation means, and the parameter for obstructing motions, and estimates an engine rotation stop position on the basis of a predicted value of the parameter representative of future motions.

17. The engine rotation stop position control apparatus according to claim 16, wherein the rotation stop position estimation means estimates a parameter representative of motions in the future by that part of a crank angle, which is obtained by dividing 720 °CA by the number of cylinders of the engine.

18. The engine rotation stop position control apparatus according to claim 16, wherein the rotation stop position estimation means estimates a parameter representative of further future motions on the basis of a predicted value of the parameter representative of future motions and the parameter for obstructing motions.

19. The engine rotation stop position control apparatus according to claim 16, wherein the rotation stop position estimation means estimates that engine rotation is stopped this

side of a crank angle of the predicted value when a predicted value of the parameter representative of future motions falls below a predetermined value.

20. The engine rotation stop position control apparatus according to claim 6, wherein the rotation stop position estimation means calculates an engine stop determination value on the basis of that parameter for obstructing motions, which is calculated by the second parameter calculation means, and makes a comparison between that parameter representative of motions, which is calculated by the first parameter calculation means, in the course, in which the engine stop means stops engine rotation, to estimate an engine rotation stop position.

21. An apparatus for estimation of kinetic energy of an internal combustion engine comprising:

kinetic energy calculation means for calculating a present kinetic energy of the internal combustion engine;

work load calculation means for calculating a work load, which obstructs motions of the internal combustion engine; and

future kinetic energy estimation means for estimating a future kinetic energy on the basis of the present kinetic energy and the work load, which are calculated by the kinetic energy calculation means and the work load calculation means.

22. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 21, wherein

the kinetic energy calculation means calculates the present kinetic energy by means of at least one of engine rotational speed, crankshaft angular velocity, and piston traveling speed.

23. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 21, wherein the work load calculation means calculates the work load by means of at least one of pumping loss, friction loss in respective parts, driving loss in respective auxiliary devices, heat loss, loss in vehicle drive system, and friction loss on road surface.

24. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 21, wherein the work load calculation means finds the work load from a difference between a past kinetic energy being a past calculated value of the kinetic energy calculation means and the present kinetic energy being a present calculated value.

25. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 21, wherein the future kinetic energy estimation means subtracts the work load calculated by the work load calculation means from the present kinetic energy calculated by the kinetic energy calculation means to thereby find the future kinetic energy.

26. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 21, further

comprising:

rotational speed estimation means for estimating a value related to a future rotational speed on the basis of the future kinetic energy estimated by the future kinetic energy estimation means.

27. The apparatus for estimation of kinetic energy of an internal combustion engine according to claim 26, wherein

the rotational speed estimation means uses a parameter, which takes account of at least one of mass of portions related to rotation of the internal combustion engine, a diameter of rotational motions of the internal combustion engine, and moment of inertia of the internal combustion engine, as variation of a value related to rotational speed to estimate the value related to the future rotational speed.